Chapter

4

FORECASTS OF AVIATION ACTIVITY

Chapter

4

FORECASTS OF AVIATION ACTIVITY

for the Airport Master Plan for Whiteriver Airport

4.0 INTRODUCTION

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement projects. While such information is essential to successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity, based upon historical data and viewed through present situations. They therefore must be used with careful consideration, as they may lose their validity through the passage of time.

For this reason, an ongoing program of examination of local airport needs, as well as national and regional trends, is recommended and encouraged in order to promote the orderly development of the Whiteriver Airport.

At airports which are not served by air traffic control towers, estimates of existing aviation activity are necessary in order to form a basis for the development of realistic forecast projections. Unlike towered airports, non-towered general aviation airports have historically not tracked and maintained comprehensive logs of aircraft operations. Estimates of existing aviation activity, based upon a review of based aircraft, available historical data, fuel sales records, and contacts with airport users form the baseline to which forecasted aviation trends are applied..

Following the development of the estimated current demand, projections are made based upon established growth rates, area demographics, industry trends and other important indicators. Forecasts are prepared for the twenty year planning period and include the Initial Term (1997-2001), the Intermediate Term (2002-2006) and the Ultimate Term (2007-2016) time frames. Having forecasts within these time frames will allow the construction of airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

There are four types of aircraft operations which are considered in the planning process. These are termed local, based, itinerant, and transient. They are defined as follows:

- **Local operations** are defined as aircraft movements (departures or arrivals) for the purpose of training, pilot currency or pleasure flying, within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas, and pleasure flights which originate and terminate at the airport under study.

- **Itinerant operations** are defined as arrivals and departures other than local operations, as described above. This type of operation is closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes.

- **Based aircraft operations** are defined as the total operations made by aircraft based at the airport under study, with no attempt to classify the operations as to purpose.

- **Transient operations** are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local versus itinerant operations.

4.1 AVAILABLE ACTIVITY FORECASTS

The establishment of an accurate basis for the forecasting of future aviation activity is of primary importance in any planning effort. The recommended practice is to begin with the examination of prior estimates and forecast figures.

In an attempt to arrive at a reasonable estimate of current usage of the Whiteriver Airport and to facilitate development of accurate forecast estimates, a review of available data was made. The data sources examined included the following:

- [1] National Plan of Integrated Airport Systems 1990-1999, Federal Aviation Administration, (NPIAS).

- [2] Arizona State Aviation Needs Study, Arizona Department of Transportation Aeronautics Division, 1995 (SANS).

- [3] Arizona State Aviation System Plan, Arizona Department of Transportation, Aeronautics Division, 1988 (ASASP).

The *FAA Terminal Area Forecasts for Fiscal Years 1991-2005* and *Fiscal Years 1995-2010*, and the *1993 FAA Census of U.S. Civil Aircraft* provided additional useful information for national and regional trends.

Estimates of existing operations and based aircraft for the Whiteriver Airport were developed by the Federal Aviation Administration and the State of Arizona, and are documented in the above referenced publications. The forecasts contained in these documents are discussed below and are depicted in Figure 4-1 along with the independent forecasts developed for this study.

The National Plan of Integrated Airport Systems, or NPIAS, contains estimates of existing operations for all airports included in the Plan. The NPIAS indicates 2,000 total estimated annual operations at the Whiteriver Airport in calendar year 1990, which is forecasted to increase to 6,000 by 1999. The Plan projected based aircraft to increase from four in 1990 to eight in 1999. Total annual operations per based aircraft in the NPIAS are estimated at 750.

The forecasts contained in the Arizona State Aviation Needs Study estimated 1,730 operations and four based aircraft in the year 1995, forecasted to remain constant over the twenty year planning period. The Needs Study estimated 434 total operations per based aircraft. Forecasts in the Needs Study were derived from forecasted registered aircraft in Arizona, which in turn were based on the forecasted number of licensed pilots in Arizona.

The Arizona State Aviation System Plan (ASASP) also includes forecasts for the Whiteriver Airport. The ASASP estimated 1,489 operations in 1994, forecasted to increase to 1,633 and 2,437 in 1997 and 2010 respectively. Based aircraft were estimated at four in 1994 and are forecasted to increase to five in the year 2010. Total operations per based aircraft in 1994 were estimated at 372, and forecasted to increase to 487 operations per based aircraft in 2010. Forecasts in the ASASP were derived using regression analysis based on population and per capita income variables.

4.2 FAA RECORDS OF BASED AIRCRAFT AND OPERATIONS

The FAA 5010 form is the official master record kept by the Federal Aviation Administration to document airport physical conditions and other pertinent information. The record includes an annual estimate of aircraft activity as well as the number of based aircraft.

The 5010 form for calendar year 1996 (with the last inspection occurring in 1993) indicates the numbers of based aircraft and annual operations at Whiteriver Airport shown in Table IV-1. As discussed in Section 4.4, there is a discrepancy in the FAA 5010 forms and the actual based aircraft and aircraft operations data resulting from a current physical inventory.

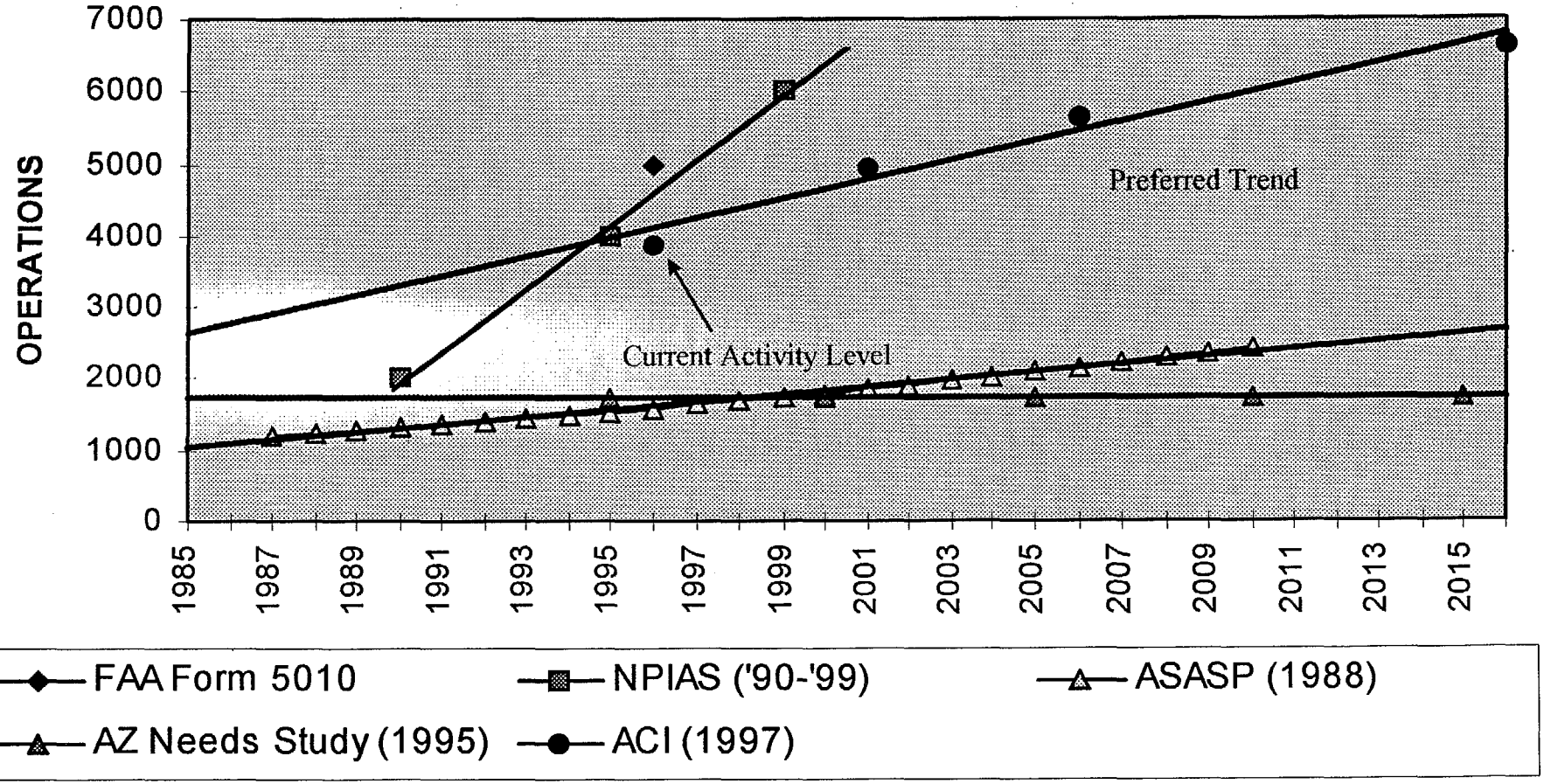


FIGURE 4-1
COMPARISON OF AIRCRAFT
OPERATIONS FORECASTS

The accuracy of the FAA Form 5010 is questionable since it indicates 500 air carrier operations and 1,000 air taxi operations. Information provided by airport management indicates these types of aircraft operations do not occur at the airport. Discounting these two categories results in 3,500 total annual aircraft operations, which is more in line with the independent estimate in this study of current aircraft activity at the airport.

TABLE IV-1
FAA FORM 5010 RECORDS OF BASED AIRCRAFT AND OPERATIONS

BASED AIRCRAFT						
Year	Single Engine	Multi Engine	GA Jets	Helicopter	Other	TOTAL
1996	4	3	0	1	0	8
ANNUAL OPERATIONS						
Year	Air Carrier	GA Local	GA Itinerant	Air Taxi	Military	TOTAL
1996	500	850	2,590	1,000	60	5,000

Source: FAA 5010 Forms calendar year 1996.

4.3 DETERMINATION OF BASED AIRCRAFT ACTIVITY: USER SURVEY RESULTS

In the process of preparing numerous airport master plans for U.S. general aviation airports, the consultant has accumulated an extensive database of information regarding aircraft operations. Over the years, airport user survey questionnaires have been distributed to aircraft owners who base their aircraft at 21 different airports. These questionnaires made inquiry as to the number of total operations performed by each based aircraft. The results of the surveys, in terms of total annual operations by based aircraft, are summarized in Table IV-2.

A User's Survey for Whiteriver Airport was distributed to three contract fire suppression service providers and three air medivac companies using Whiteriver Airport. The fire suppression aircraft are based at the airport during fire season, and the medivac aircraft are transient aircraft that provide year-round service to the Whiteriver area. Four of the six airport users completed and returned the survey and one airport user was contacted by telephone for a response rate of 83%. Annual operations by each *based* aircraft (fire suppression) at Whiteriver averaged 753, and transient medivac averaged 435 operations per aircraft.

TABLE IV-2
AIRPORT USER SURVEYS 1988-1996
SUMMARY OF BASED AIRCRAFT OPERATIONS

AIRPORT	YEAR	Annual Operations
Sawyer County - Hayward Municipal Airport (WI)	1988	208
Buffalo Municipal Airport (MN)	1989	481
Mora Municipal Airport (MN)	1989	232
Two Harbors Municipal Airport (MN)	1989	275
Rusk County Airport (WI)	1989	97
Chippewa Valley Regional Airport (WI)	1990	217
Cumberland Municipal Airport (WI)	1990	220
Brainerd -Crow Wing County Regional (MN)	1990	566
Canby Municipal Airport (MN)	1991	118
Glencoe Municipal Airport (MN)	1991	119
Portage Municipal Airport (WI)	1992	360
Rush City Municipal Airport (MN)	1992	116
Thief River Falls Regional Airport (MN)	1992	194
Pershing County - Derby Field (NV)	1993	205
Cambridge Municipal Airport (MN)	1993	115
Cloquet Municipal Airport (MN)	1993	410
Rexburg-Madison County Airport (ID)	1994	427
Douglas Municipal Airport (AZ)	1994	138
Red Wing Municipal Airport (MN)	1994	128
O'Connor Field (AZ)	1996	276
San Carlos Apache Regional Airport (AZ)	1996	163
Average Annual Operations by Each Based Aircraft		**241**

Source: Nicholas J. Pela and Armstrong Consultants, Inc. research

4.4 AIRPORT TRAFFIC MIX DETERMINATION

An inventory of aircraft which are actually based at the Whiteriver Airport was conducted as a part of the initial data collection process for this master plan. The inventory reveals a discrepancy between the FAA records of based aircraft and the number of aircraft actually present at the airport. This is illustrated in Table IV-3.

TABLE IV-3
ACTUAL BASED AIRCRAFT VERSUS FAA RECORDS

	Single Engine	Multi Engine Piston	Multi Engine Turbo Prop	GA Jet	Rotor-craft	Other	TOTAL
1994 Form 5010[1]	4	3	0	0	1	0	8
Inventory (10/96)[1]	1	1	0	0	1	0	3

[1] *Includes fire suppression aircraft based at the airport April through September.*

There are no permanently based aircraft at Whiteriver Airport. Based aircraft in this case are considered those aircraft which are contracted by the Bureau of Indian Affairs Fire Management Service and based at the airport from April through September. These aircraft are based elsewhere the remainder of the year.

For the purposes of this study it is appropriate to use the actual inventory data, including the Fire Management aircraft, as a baseline for future projections. The FAA 5010 is not believed to accurately reflect the current number of based aircraft. The FAA master record will be updated to reflect the actual count.

4.5 DETERMINATION OF EXISTING ACTIVITY LEVEL

In order to determine existing activity levels, aircraft operations at Whiteriver Airport were classified into three categories: 1) Fire Management, 2) Air Medivac, and 3) Other General Aviation (which includes tourist, recreational, training, and business aircraft operations). The annual operations estimates are summarized at the end of this Section in Table IV-8 and Figure 4-2, and are explained in detail in the following paragraphs and Tables.

- Fire Management Aircraft Operations: Responses from Airport User's Surveys were used to determine annual operations by fire suppression and medivac aircraft. Responses from fire management contractors were compared to airport operations log figures (provided by airport operations personnel) resulting in a correlation of .84 (the closer the correlation coefficient approaches 1.0, the closer the relationship between the two figures). Airport operations personnel are on duty throughout all fire management operations which would lead to a high degree of accuracy for tracking these aircraft operations. An estimated 2,260 operations by *fire management* aircraft occurred in the base year, 1996.

TABLE IV-4
FIRE MANAGEMENT AIRCRAFT ACTIVITY LEVEL
BASE YEAR 1996

	BASED AIRCRAFT	OPERATIONS
Fire Management		
Single-Engine	1	300
Multi-Engine Piston	1	1,560
Helicopter	1	400
Total	**3**	**2,260**

- Air Medivac Aircraft Operations: On the other hand, a comparison of the medivac user survey responses to the airport operations log resulted in a .14 correlation coefficient. Since the airport operations personnel work limited hours in the off-season (October through March) and do not work weekends, the accuracy of the airport operations log for medivac flights would be reduced. User responses were considered accurate for the estimating purposes in this study and resulted in 870 estimated annual aircraft operations by *medivac* aircraft.

TABLE IV-5
MEDIVAC AIRCRAFT ACTIVITY LEVEL
BASE YEAR 1996

	OPERATIONS
Air Medivac	
Multi-Engine Piston	120
Multi-Engine Turboprop	750
Total	**870**

- Other General Aviation Aircraft Operations: The same limiting factors in the airport logs with respect to medivac operations makes it difficult to estimate the number of other general aviation aircraft utilizing Whiteriver Airport. Interviews with airport operations personnel indicated occasional single and multi-engine transient traffic at the airport. In the fall, a surge of business jet traffic is experienced in conjunction with large game hunting season and guided hunts provided by the Tribal Department of Recreation and Wildlife. Seventy-five hunters are booked for the 1997 hunting season, with 25 arriving by aircraft. This results in 50 estimated business jet operations. Fuel is available during limited time periods causing transient aircraft to obtain fuel elsewhere; therefore, fuel delivery records would not accurately reflect transient traffic levels. Further discussions with contract operators indicated approximately one transient aircraft per day (other than medivac) during the week and two on the weekends from April through September. From October through March,

other general aviation traffic can be estimated at approximately half that amount. Applying this usage rate to the number of week days and weekend days in each season, plus the 50 hunting season business operations results in 805 estimated annual operations by *other general aviation* aircraft.

TABLE IV-6
OTHER GENERAL AVIATION AIRCRAFT ACTIVITY LEVELS
BASE YEAR 1996

	US FLEET MIX %	OPERATIONS
Other General Aviation		
Single-Engine	78.0%	590
Multi-Engine Piston	9.8%	77
Multi-Engine Turboprop	2.0%	14
Jet[1]	2.0%	64
Helicopter	4.0%	30
Other[2]	4.2%	30
Total	**100%**	**805**

[1]Actual jet operations higher than 2.0% due to hunting season surge.
[2]Includes experimental, ultra-light, and lighter than air.

- Itinerant Versus Local Operations: Itinerant operations at Whiteriver Airport account for approximately 95% of total operations. Although fire patrol and suppression aircraft usually do not land at other airports, their operations are considered itinerant. These aircraft do not remain in the local traffic pattern, or in the vicinity of the airport. Typical destinations range from 10 to 100 miles to attack fires throughout the Reservation and the surrounding areas. A small amount of training flights are accomplished by students from other airports. These students, usually on "cross country" or "proficiency flights" may accomplish a number of touch and goes at the airport, then return to their based airport. These touch and goes would be considered local operations. Medivac, business, and tourist airport users accomplish primarily itinerant operations at Whiteriver Airport. For this reason itinerant operations are estimated at 95% of total operations.

- Annual Operations by Aircraft Type: To arrive at an estimate of aircraft operations by aircraft type, the number of aircraft operations by fire management and medivac aircraft were applied to the respective types of aircraft which they utilize. The average U.S. general aviation fleet mix was applied to the other general aviation aircraft operations to establish the relative percentage of use by each type of aircraft represented. The estimated annual operations by respective aircraft type is shown in Table IV-7. (Jet operations are slightly higher than their fleet percentage due to the hunting season surge).

TABLE IV-7
ANNUAL AIRCRAFT OPERATIONS BY AIRCRAFT TYPE
BASE YEAR 1996

	BASED AIRCRAFT	OPERATIONS
Single-Engine	1	890
Multi-Engine Piston	1	1,757
Multi-Engine Turboprop	0	764
Business Jet	0	64
Helicopter	1	428
Other[1]	0	30
Total	**3**	**3,933**

[1]*Includes experimental, ultra-light, and lighter than air.*

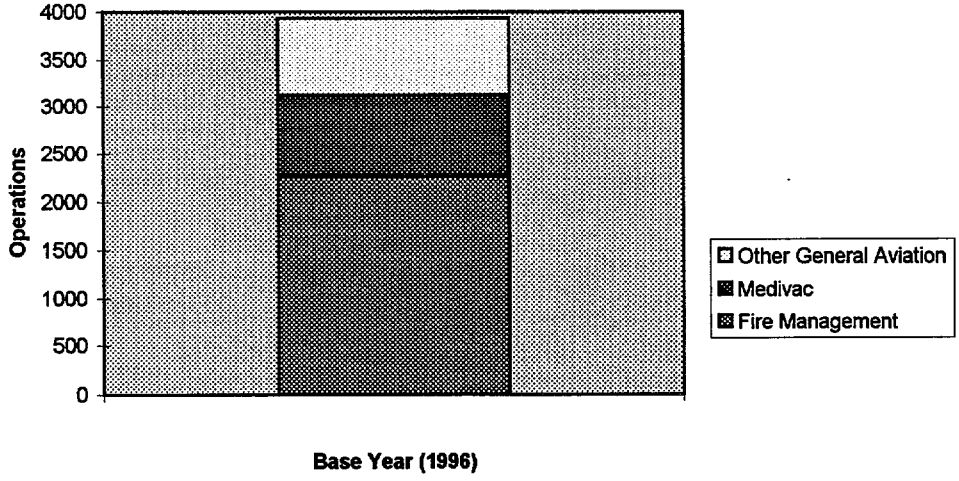
4.5.1 Summary of Existing Aviation Activity (Base Year 1996)

The estimates of existing activity levels for each of the three categories discussed above were combined to arrive at the estimated total annual aircraft operations at Whiteriver Airport These totals are expressed in Table IV-8 and in Figure 4-2.

TABLE IV-8
SUMMARY OF EXISTING AIRCRAFT ACTIVITY LEVELS
BASE YEAR 1996

	Based	OPERATIONS		
	Aircraft	Local	Itinerant	TOTAL
Whiteriver Airport	3	197	3,736	3,933

FIGURE 4-2
EXISTING ANNUAL AIRCRAFT OPERATIONS



4.6 DEVELOPMENT OF AVIATION FORECASTS

Whiteriver Airport is unique in that it serves three distinct categories of users; 1) Fire Management, 2) Air Medivac, and 3) Other General Aviation. Traditional forecasting techniques cannot be applied across the board to total operations since different factors influence each category. In the following paragraphs, each category is analyzed independently to develop their respective forecasts. Fire management aircraft activity is forecasted based on a linear regression trend of historical activity, with an adjustment for the addition of one helicopter. Air Medivac activity is forecasted based on a market share ratio of patient transports per population level. Other general aviation activity is forecasted based on a market share ratio of aircraft operations per Tribal enterprise revenue dollar generated. The categories are then combined to arrive at the overall forecasts for Whiteriver Airport.

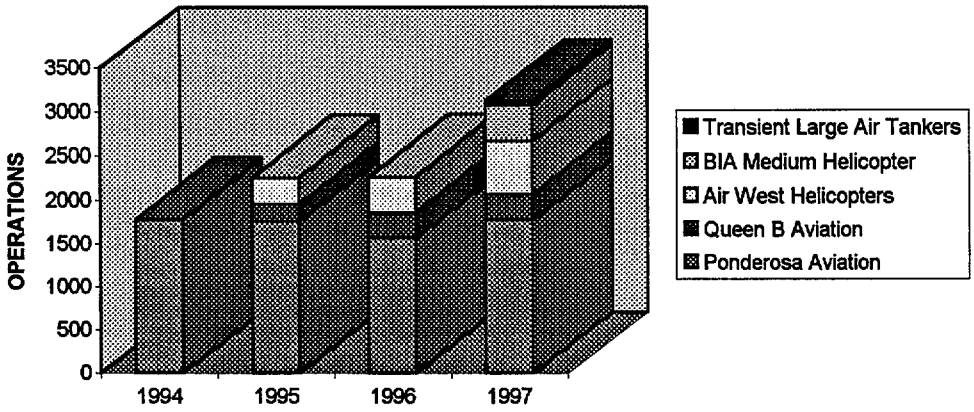
4.6.1 Forecasts of Fire Management Aircraft Activity

Demand for fire patrol and fire suppression operations from Whiteriver Airport is driven to a large amount by nature. Meteorological conditions, including precipitation, temperature, winds, and lightning affect the frequency and severity of wild fires. During heavy burn seasons, more operations will be flown, and during light burn seasons, less operations will be flown. Since it is difficult to predict the occurrence of these wild fires, a historical review of operations over the last three years, and estimates from contract service providers for 1997 are used to determine existing trends and to forecast future demand.

Other factors which influence the use of Whiteriver Airport for fire management, is the demand for a large tanker reloading facility in the area, and fire fighter training requirements.

Information provided by Queen B Aviation, which provides fire suppression services with a light air tanker, Ponderosa Aviation, which provides air patrol services with an Aero Commander, and Air West Helicopters, which provides fire fighter transport with a Bell 206 helicopter is depicted in Figure 4-3. This figure depicts the total fire management operations flown by these companies in 1994, 1995, and 1996, and those projected to be flown in 1997. Also included in the 1997 figure are approximately 400 operations by a medium sized helicopter (most likely a Bell 204 aircraft) which is anticipated to be based at Whiteriver Airport for additional fire fighter transport and training capability.

FIGURE 4-3
FIRE MANAGEMENT AIRCRAFT OPERATIONS



Historically, the number of fixed wing fire management aircraft operations by based aircraft has remained constant over the past three years with approximately 1,700 patrol operations per year and 300 suppression operations per year. This level of activity is expected to remain constant over the planning period. With the addition of Air West Helicopters in 1995, the number of helicopter operations has increased slightly, indicating increased demand. The addition of a medium sized helicopter in 1997 is anticipated to meet the increased demand. Therefore, fire management helicopter operations are expected to increase to 1,000 in 1997, then remain constant throughout the rest of the planning period.

Prior to the deterioration of the runway, large tanker aircraft which include DC-4s, DC-6s, P-3s, and PV-2s, operated out of Whiteriver. These aircraft now operate out of Winslow Municipal Airport, located approximately 80 NM northwest. Upon rehabilitation of the pavements at Whiteriver Airport, these aircraft are expected to occasionally utilize the airport as a reloading station. The Bureau of Indian Affairs Regional Fire Management Aviation Control Center estimates 10 to 25 landings per year, or up to 50 annual operations, at Whiteriver Airport. This estimate is expected to remain constant throughout the planning period.

TABLE IV-9
FORECASTS OF FIRE MANAGEMENT AIRCRAFT OPERATIONS

	1996	2001	2006	2016
	Estimated	Forecasted		
Fire Patrol	1,560	1,700	1,700	1,700
Fire Suppression	300	300	300	300
Helicopter	400	1000	1000	1000
Large Tanker	0	50	50	50
TOTAL	**2,260**	**3,050**	**3,050**	**3,050**

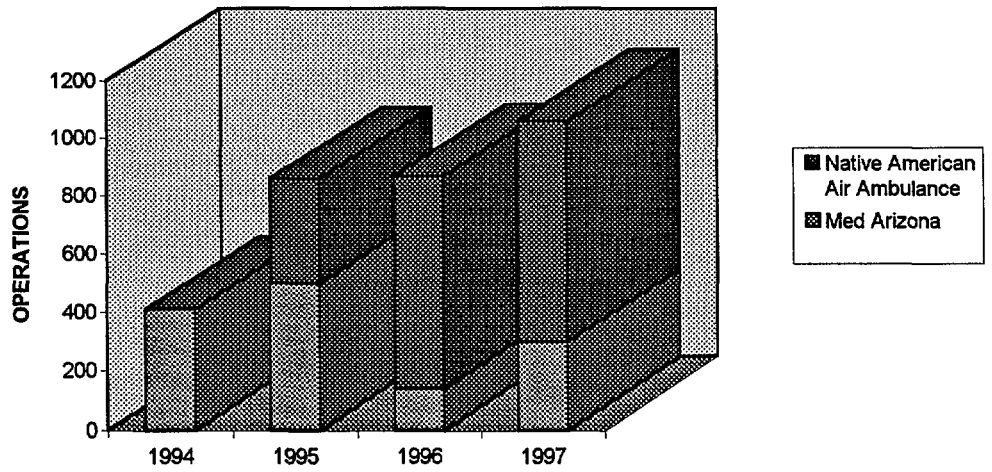
4.6.2 Forecasts of Air Medivac Aircraft Activity

The demand for air medivac service is driven by a combination of proximity to adequate medical facilities, age distribution of the population, and general health characteristics of the population.

The Indian Health Service Clinic, located in Whiteriver, provides treatment for minor injuries and stabilizes critical patients for transport. The closest hospital to Whiteriver is in Show Low, approximately 37 miles, and the closest level-one trauma centers are located in Phoenix and Tucson, approximately 115 and 150 miles respectively. Transport of patients to Phoenix or Tucson is accomplished primarily by air medivac.

Information provided by Native American Air Ambulance and Med Arizona, which provide air medivac service to Whiteriver, is depicted in Figure 4-4. This Figure depicts the total air medivac operations flown by these companies in 1994, 1995, and 1996, and those projected to be flown in 1997.

FIGURE 4-4
MEDIVAC AIRCRAFT OPERATIONS



As can be seen in the Figure, Native American Air Ambulance has captured a large percentage of the market share for Whiteriver since 1994. Through 1996 they have utilized a BAe Jetstream 31 aircraft. Beginning in 1997, they will transition to a Cessna Citation aircraft. The demand for air medivac service in 1996, as a percentage of total population, is estimated at 5.6%, or a demand for roughly one medivac flight per 36 people (which equates to one medivac aircraft operation per 18 people). Social conditions on the Fort Apache Reservation, including health problems, injuries, and alcohol and drug abuse are major factors driving the demand for hospitalization and air medivac services. Considering the unfavorable socioeconomic factors discussed in Chapter 3, which include high unemployment, high birth rate, low income, and insufficient housing, demand for medivac service is expected to continue at a rate at least equal to the current demand level. Population projections for the years 2001, 2006, and 2016 were applied to the demand level of one aircraft operation per 18 people to determine the forecasted number of medivac aircraft operations. The results are shown in Table IV-10.

TABLE IV-10
FORECASTS OF MEDIVAC AIRCRAFT OPERATIONS

	1996	2001	2006	2016
	Estimated	Forecasted[2]		
Whiteriver Population[1]	15,472	18,200	21,400	29,600
Medivac Operations	**870**	**1,000**	**1,200**	**1,600**

[1]Projected population based on 3.3% annual increase, rounded to nearest hundred.
[2]Rounded to nearest hundred.

4.6.3 Other General Aviation Aircraft Operations

Traditional tools utilized to forecast aviation activity at general aviation airports consider the relationship between current aviation activity, population, and personal income. The assumption is made that with a constant per capita income, general aviation activity will vary directly with population. In theory, when personal income increases a larger percentage of income is available to be used in acquisition and use of general aviation aircraft. However, in the case of Whiteriver Airport, personal income is low, and the local population are not the users of the airport. The airport is used by fire management services, air medivac providers, and transient businesses, tourists, and general aviation pilots visiting Whiteriver.

Factors used to forecast "Other General Aviation" activity at Whiteriver include Tribal enterprise revenues, economic development, and tourism.

Based Aircraft: Personal income levels on the Fort Apache Indian Reservation are not such to accommodate individual aircraft ownership; however, it is probable the White Mountain Apache Tribe will acquire an aircraft in the 6-10 year time frame. A Tribal corporate aircraft would serve as a convenient connection to commercial airlines at Phoenix or Tucson, and would serve as an efficient transportation method to conduct Tribal business throughout the region. A single-engine piston aircraft is initially anticipated, which would likely be upgraded to a multi-engine piston aircraft in the 11-20 year time frame. Annual operations by this aircraft are expected to coincide with the average usage found in the surveys discussed in Section 4.3 of 241 operations per year (rounded to 250 in Table IV-9). Considering this aircraft will be used for business purposes, operations are estimated to be 90% itinerant and 10% local.

Aircraft other than fire management aircraft and a Tribal aircraft are not anticipated to be based at the Whiteriver Airport within the planning period.

Annual Aircraft Operations: The existing number of "Other General Aviation" aircraft operations are tied to Tribal enterprise revenues, which include economic development and tourism factors. As economic development and tourism continue to grow, aircraft operations at Whiteriver Airport are expected to increase. The number of aircraft operations per revenue dollar was calculated utilizing gross revenue figures for 1996 obtained from the White Mountain Apache Tribal Planning Department. This ratio was applied to the projected gross revenues, also obtained from the Tribe, for the twenty year planning period. The resulting forecast of annual aircraft operations by "Other General Aviation" aircraft is included in Table IV-11.

TABLE IV-11
FORECASTS OF "OTHER GENERAL AVIATION" ACTIVITY

	1996	2001	2006	2016
	Estimated	Forecasted		
Based Aircraft	0	0	1	1
Aircraft Operations	0	0	250	250
Tribal Gross Revenues[1]	$80,000,000	$97,000,000	$118,000,000	$175,000,000
Aircraft Operations[2]	805	900	1,100	1,700
TOTAL OPERATIONS[2]	**805**	**900**	**1,400**	**2,000**

[1] *Gross revenue forecasts in constant 1996 dollars.*
[2] *Forecasts rounded to nearest hundred.*

4.6.4 Forecasts of Annual Operations: Combined - All User Categories

The forecasts developed in Sections 4.6.1, 4.6.2, and 4.6.3 for Fire Management, Air Medivac, and Other General Aviation categories were combined to arrive at the forecasts of total aircraft operations for the twenty year planning period. The combined forecasts are depicted in Figure 4-5 and in Table IV-12

FIGURE 4-5
COMBINED FORECASTS OF ANNUAL OPERATIONS

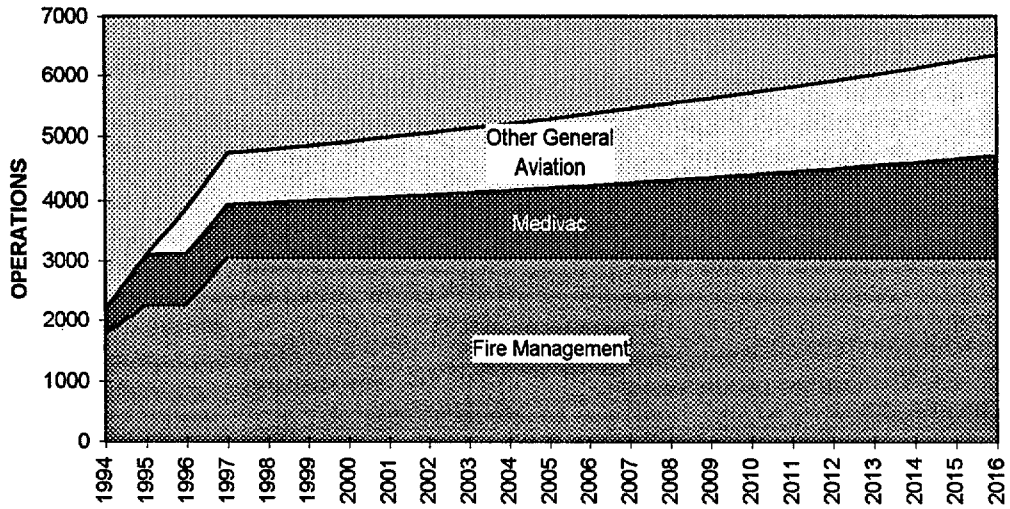


TABLE IV-12
FORECAST OF ANNUAL AIRCRAFT OPERATIONS

	1996	2001	2006	2016
Fire Management	3,050	3,050	3,050	3,050
Air Medivac	870	1,000	1,200	1,600
Other GA	805	900	1,400	2,000
TOTAL	**3,933**	**4,950**	**5,650**	**6,650**

4.6.5 Summary of Forecasts of Aviation Activity

Figure 4-1 is an illustration of the comparison of forecasts from the National Plan of Integrated Airport Systems (NPIAS), the Arizona State Aviation System Plan (ASASP), the Arizona State Aviation Needs Study, and the independent forecasts developed in this study. The preferred trend line for the planning period correlates to an average annual increase in operations of approximately 3.5 percent.

TABLE IV-13
FORECAST OF AVIATION ACTIVITY

Year	Based Aircraft	Local Operations	Itinerant Operations	Total Operations
1996	3	197	3736	**3,933**
2001	4	248	4,702	**4,950**
2006	5	283	5,367	**5,650**
2016	5	333	6,317	**6,650**

To estimate the number of operations by aircraft type, the number of operations by the types of aircraft utilized in the Fire Management and Air Medivac categories were calculated. The national general aviation fleet mix percentages were applied to the forecast of operations for the Other General Aviation category to determine the number of operations by the respective aircraft in that category. The subtotals for each category were added to determine total operations by each aircraft type. Table IV-14 depicts the forecasted annual operations by respective aircraft type.

TABLE IV-14
DETAILED FORECASTS BY AIRCRAFT TYPE

	1996		2001		2006		2016	
	Based Aircraft	Operations	Based Aircraft	Operations	Based Aircraft	Operations	Based Aircraft	Operations
Single Engine	1	890	1	1,002	2	1,392	2	1,860
Multi-Engine Piston	1	1,754	1	1,976	1	2,053	1	2,167
Multi-Engine Turboprop	0	764	0	460	0	560	0	749
Business Jet	0	64	0	438	0	530	0	710
Rotorcraft	1	428	2	1,036	2	1,056	2	1,080
Other	0	30	0	38	0	59	0	84
Total	**3**	**3,933**	**4**	**4,950**	**5**	**5,650**	**5**	**6,650**

4.7 AIRPORT SEASONAL USE DETERMINATION

A seasonal fluctuation in aircraft operations may be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and at general aviation airfields. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

At Whiteriver Airport, only the aircraft operations in the "Other General Aviation" category follow a seasonal use trend curve similar to that of other general aviation airports in the region. Fire management operations are condensed into a five month season, with a majority of the operations occurring in the middle three months. Air Medivac operations can be spread approximately evenly throughout the year.

Table IV-15 depicts the seasonal use trend curves for each of the three airport user categories. The "Other General Aviation" trend curve is a representative curve based upon an average of seasonal trend curves from FAA towered airports throughout the nation (from the *FAA Statistical Handbook of Aviation)* and nontowered airports located in the same latitude as Whiteriver Airport.

TABLE IV-15
SEASONAL USE TREND CURVES

Month	Fire Management	Medivac	Other GA
January		8.33%	5.35%
February		8.33%	6.10%
March		8.33%	6.70%
April		8.33%	8.25%
May	5.00%	8.33%	10.20%
June	30.00%	8.33%	11.45%
July	30.00%	8.33%	11.95%
August	30.00%	8.33%	10.85%
September	5.00%	8.33%	9.35%
October		8.33%	7.90%
November		8.33%	6.45%
December		8.33%	5.45%

Percentages may not add due to rounding.

4.8 AIRPORT CAPACITY CALCULATION METHODOLOGY

The methodology for computing the relationship between an airport's demand versus its capacity is contained in FAA Advisory Circular AC 150/5060-5, *Airport Capacity and Delay.*

In order to facilitate this comparison, computations were made to determine the hourly capacity of the existing airport in Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions. The Annual Service Volume (ASV) of the airport in its ultimate development condition was also determined.

The hourly capacity determinations were made using the assumptions recommended in the Advisory Circular for the particular airport layout and conditions, combined with the forecast operational data generated with this study. The physical aspects of the four aircraft Classes, not to be confused with the aircraft approach categories discussed in Chapter 2, are described in Table IV-10 below. The assumptions used in the capacity calculations are: 1) a traffic mix of approximately 35 percent of operations by Class A aircraft, 45 percent by Class B aircraft, 20 percent by Class C aircraft, and none by Class D aircraft, 2) percent of arrivals equals departures, 3) touch-and-goes account for less than 50 percent of the operations, 4) a full-length parallel taxiway is provided, and 5) there are no airspace limitations which would adversely impact or otherwise restrict aircraft which could operate at the airport.

TABLE IV-16
FAA AIRCRAFT CLASSIFICATIONS FOR CAPACITY CONSIDERATIONS

CLASS	MAXIMUM TAKEOFF WEIGHT	ENGINES
A	12,500 lbs. or less	Single
B	12,500 lbs. or less	Multi Engine
C	12,500 to 300,000 lbs.	Multi Engine
D	Over 300,000 lbs.	Multi Engine

The Whiteriver Airport, in its existing configuration, operates only during visual meteorological conditions. Nonprecision instrument operations are expected in the future.

4.9 RUNWAY CAPACITY

Using the above conditions and applying them to the Hourly Capacity charts in the Advisory Circular, it is seen that the average peak capacities for the existing airport with a full length parallel taxiway are as follows:

TABLE IV-17
HOURLY CAPACITY - OPERATIONS PER HOUR

	VFR	IFR
RUNWAY 01	98	59
RUNWAY 19	98	59

Assuming no significant change in the traffic mix, the proposed development at Whiteriver Airport is not expected to increase the capacity of the airport, however; rehabilitating the runway is necessary for continued use by current aircraft and strengthening the runway will increase the utility of the airport to support heavier aircraft. The runway capacities will remain the same throughout the planning period.

4.10 HOURLY DEMAND AND PEAKING TENDENCIES

In order to arrive at a reasonable estimate of the actual demand upon the airport facilities, it was necessary to develop a method to calculate the estimated Maximum Peak Hourly Demand which might be expected to occur. The Seasonal Use Trend Curve, as presented in Table IV-15, was used as a tool to determine this usage.

Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

Where	T	=	Monthly percent of use (from curve).
	M	=	Average monthly operations.
	A	=	Total annual operations.
	D	=	Average Daily Operations in a given month.
	M	=	A (T / 100)
	D	=	M / (365 / 12)

Experience has shown that approximately 90 percent of total daily operations will occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, and that the maximum peak hourly occurrence may be 50 percent greater than the average of the hourly operations calculated for this time period.

The Estimated Peak Hourly Demand (P) in a given month was, therefore, determined by compressing 90 percent of the Average Daily Operations (D) in a given month into the 12 hour peak use period, reducing that number to an hourly average for the peak use period, and increasing the result by 50 percent, as follows:

Where	D	=	Average Daily Operations in a given month.
	P	=	Peak Hourly Demand in a given month.
	P	=	1.5 (0.90D / 12)

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in Table IV-18. As is evident in the Table, the Maximum Peak Hourly Demand occurs under VFR weather conditions in the month of July, with 4 operations per hour in the existing time frame (1996) and 8 operations per hour in 2016.

TABLE IV-18
ESTIMATED HOURLY DEMAND / MONTH

Monthly/Daily/Hourly Demand

Base Year: 1996
Operations: 3,933

Operations Month	Fire Mgt 2,260 % Use	Medivac 870 % Use	Other GA 805 % Use	Operations Monthly	Operations Daily	Operations Hourly
January		8.33	5.35	116	4	0
February		8.33	6.10	122	4	0
March		8.33	6.70	126	4	0
April		8.33	8.25	139	5	1
May	5.00	8.33	10.20	268	9	1
June	30.00	8.33	11.45	843	28	3
July	**30.00**	8.33	**11.95**	847	**28**	**3**
August	30.00	8.33	10.85	838	28	3
September	5.00	8.33	9.35	261	9	1
October		8.33	7.90	136	4	1
November		8.33	6.45	124	4	0
December		8.33	5.45	116	4	0

Planning Year: 2001
Operations: 4,950

Operations Month	Fire Mgt 3,050 % Use	Medivac 1,000 % Use	Other GA 900 % Use	Operations Monthly	Operations Daily	Operations Hourly
January		8.33	5.35	131	4	0
February		8.33	6.10	0	0	0
March		8.33	6.70	0	0	0
April		8.33	8.25	0	0	0
May	5.00	8.33	10.20	153	5	1
June	30.00	8.33	11.45	915	30	3
July	**30.00**	8.33	**11.95**	**915**	**30**	**3**
August	30.00	8.33	10.85	915	30	3
September	5.00	8.33	9.35	153	5	1
October		8.33	7.90	0	0	0
November		8.33	6.45	0	0	0
December		8.33	5.45	0	0	0

TABLE IV-18 (Continued)
ESTIMATED HOURLY DEMAND / MONTH

Monthly/Daily/Hourly Demand

Planning Year: 2006
Operations: 5,650

Operations Month	Fire Mgt 3,050 % Use	Medivac 1,200 % Use	Other GA 1,400 % Use	Operations Monthly	Operations Daily	Operations Hourly
January		8.33	5.35	175	6	1
February		8.33	6.10	185	6	1
March		8.33	6.70	194	6	1
April		8.33	8.25	215	7	1
May	5.00	8.33	10.20	395	13	1
June	30.00	8.33	11.45	1,175	39	4
July	**30.00**	8.33	**11.95**	1,182	**39**	**4**
August	30.00	8.33	10.85	1,167	38	4
September	5.00	8.33	9.35	383	13	1
October		8.33	7.90	211	7	1
November		8.33	6.45	190	6	1
December		8.33	5.45	176	6	1

Planning Year: 2016
Operations: 6,650

Operations Month	Fire Mgt 3,050 % Use	Medivac 1,600 % Use	Other GA 2,000 % Use	Operations Monthly	Operations Daily	Operations Hourly
January		8.33	5.35	240	8	1
February		8.33	6.10	255	8	1
March		8.33	6.70	267	9	1
April		8.33	8.25	298	10	1
May	5.00	8.33	10.20	490	16	2
June	30.00	8.33	11.45	1,277	42	5
July	**30.00**	8.33	**11.95**	1,287	**42**	**5**
August	30.00	8.33	10.85	1,265	42	5
September	5.00	8.33	9.35	473	16	2
October		8.33	7.90	291	10	1
November		8.33	6.45	262	9	1
December		8.33	5.45	242	8	1

The Maximum Peak Hourly Demand in the existing time frame represents approximately 3% of the estimated hourly capacity of the runway under VFR conditions, and ultimately 5% of the estimated hourly capacity of the runway under VFR conditions and 8% under IFR conditions.

4.11 ANNUAL SERVICE VOLUME

The Annual Service Volume, or ASV, is a calculated reasonable estimate of an airport's annual capacity, taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in a year's time. When compared to the forecast or existing operations of an airport, the ASV will

give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular AC 150/5060-5.

The approximate Annual Service Volume for the Whiteriver Airport in its ultimate condition is 230,000 operations per year. Under these conditions, the facility will not exceed its capacity within the time frame of this study.

4.12 CRITICAL AIRCRAFT DETERMINATION

The "critical", or "design", aircraft for any given airport facility is defined as that aircraft (or group of aircraft) whose dimensional and/or performance characteristics are the basis for selection of facilities design criteria. The critical aircraft must be demonstrated to account for a minimum of 500 annual actual or forecast itinerant operations.

Different aircraft may govern the requirements for runway design, and for lateral and vertical separation standards. The factors usually considered are the aircraft maximum gross takeoff weight, approach speed category, wingspan, and tail height.

The critical aircraft currently using the Whiteriver is a British Aerospace Jetstream 31, operated by Native American Air Ambulance, which logged approximately 730 itinerant operations in 1996. This aircraft has an ARC of B-II and a maximum certificated takeoff weight of 14,550 pounds. Business jet operations account for less than 400 annual operations which are a combination of B-II and C-I aircraft. Since operations of B-II aircraft account for over 500 annual itinerant operations at Whiteriver Airport it is appropriate to designate the current Airport Reference Code as a B-II.

Upon rehabilitation of the runway, large tanker aircraft are expected to utilize the airport on an occasional basis (approximately 50 operations per year) as discussed in Section 4.6.1. These aircraft are not expected to exceed 500 operations within the planning period. Business jet operations are forecasted to reach 500 annual operations in the 6 to 10 year time frame, and 700 annual operations in the 11 to 20 year time frame. The future Airport Reference Code is expected to remain a B-II for aircraft weighing less than 60,000 pounds, which will include the BAe Jetstream 31, Cessna Citation, and Rockwell Aero Commander. Increaseing the weight bearing capacity of the pavements to approximately 80,000 Dual Wheel Gear (DWG) will accommodate the forecasted 50 annual operations by large tanker aircraft. A listing of the forecasted critical aircraft fleet is included in Table IV-17. (Note: All aircraft listed in Table IV-17 may not be able to operate out of Whiteriver Airport at maximum or reduced takeoff weight due to density altitude and available runway length .)

TABLE IV-19
REPRESENTATIVE CRITICAL AIRCRAFT DESIGN FLEET

Whiteriver Airport
Critical Aircraft Design Fleet
(A-I, A-II, B-I, B-II weighing less than 60,000 pounds)

P A R A M E T E R S :
DENSITY ALTITUDE : 7790 MSL
GENERAL TYPE CODE : General
U.S CUSTOMARY UNITS : Speed in knots.....Lengths in Feet.....Weight in Pounds

Greater Than:	0.00	0.00	0.00	0.00	0.00	0.00
& Less Than:	121.00	79.00	200.00	100.00	60000.00	10000.00
Model	AppSpeed	WingSpan	ACLength	TailHite	TOweight	RWindex
Aeronca 7AC Champ	43	35.00	21.42	8.58	1220	----
BAe Jetstream 3100	109	52.00	47.10	17.50	14550	----
Beechcraft 65 Queen Air	90	45.88	33.33	14.17	7700	4191
Beechcraft B55	95	37.80	28.00	9.60	5100	----
Beechcraft E55	95	37.80	29.90	9.10	5300	----
Beechcraft 58	96	37.80	29.90	9.50	5550	----
Beechcraft 58P	101	37.80	29.90	9.10	6200	----
Beechcraft 58TC	101	37.80	29.90	9.10	6200	----
Beechcraft A36	68	33.50	27.50	8.40	3650	----
Beechcraft B36TC	74	37.80	27.50	8.40	3850	----
Beechcraft F33A	66	33.50	26.70	8.30	3400	----
Beechcraft V35B	66	33.50	26.40	7.60	3400	----
Beechcraft C99	107	45.90	44.50	14.40	11300	----
Beech Duchess 76	78	38.00	29.00	9.50	3900	----
Beech Duke B60	98	39.30	33.80	12.30	6775	----
Beechcraft C90	99	50.30	35.50	14.30	9650	----
Beechcraft F90	103	45.90	39.80	15.10	10950	----
Beech C23	66	32.80	25.80	8.30	2450	----
Beech Sierra C24R	78	32.80	25.80	8.10	2750	----
Beech Skipper 77	61	30.00	24.00	6.90	1675	----
Beechcraft C23	68	32.80	25.80	8.30	2450	----
Beechcraft B200	98	54.50	43.80	15.00	12500	4448
Beechcraft B200	98	54.50	43.80	15.00	11000	4158
Beechcraft B300	107	54.50	43.70	15.00	14000	----
Beechcraft 1900	120	54.50	57.80	14.90	15245	----
Beechcraft E-18S	87	49.20	35.10	10.50	9300	5182
Beechcraft B100	111	45.90	39.90	15.40	11500	5348
Beechcraft B100	111	45.90	39.90	15.40	10000	4658
BritainNorman BN2B	51	49.00	35.70	12.90	6600	----
Casa C-212	92	62.30	49.80	21.80	16427	----
Cessna 152	56	33.20	24.10	8.50	1670	----
Cessna 170	65	36.00	25.00	6.42	2200	----
Cessna Cutlass	62	36.00	26.10	8.10	2550	----
Cessna 172RG	65	36.00	27.40	8.80	2650	----
Cessna 177	64	35.63	26.96	9.08	2350	----
Cessna 177B	60	35.50	27.25	8.58	2500	2781
Cessna 182Q	64	36.00	28.00	9.20	2950	2683
Cessna T182	70	36.00	28.40	9.20	3100	----
Cessna R182	65	36.00	28.60	8.90	3100	----
Cessna TR182	65	35.80	28.60	8.90	3100	----
Cessna U206G	70	36.00	28.20	9.20	3600	----
Cessna TU206G	70	36.00	28.20	9.30	3600	----
Cessna 207A	75	35.80	32.20	9.60	3800	----

Model	AppSpeed	WingSpan	AClength	TailHite	TOweight	RWindex
Cessna T207A	75	35.80	32.20	9.60	3800	----
Cessna T210N	75	36.80	28.20	9.70	4000	----
Cessna P210N	75	36.80	28.20	9.60	4000	----
Cessna T303	81	39.00	30.40	13.20	5150	----
Cessna 310R	93	36.92	31.96	10.67	5500	5950
Cessna 208 Caravan	72	51.80	37.60	14.20	7000	----
Cessna Agtruck	73	41.70	25.90	8.20	4200	----
Cessna Aghusky	75	41.70	26.50	8.10	4400	----
Cessna Citation I C500	107	47.10	43.50	14.30	11850	----
Cessna 525 CitationJet	107	46.67	42.50	13.58	10400	----
Cessna Citation II C550	105	52.20	47.20	15.00	14300	----
Cessna Citation III C650	116	53.50	55.50	17.30	21000	----
DHC-6-300	75	65.00	51.80	19.50	12500	----
Embraer EMB-110P2	94	50.30	49.50	16.10	12500	----
Falcon 10	104	42.90	45.50	15.10	14000	3619
Falcon 10	104	42.90	45.50	15.10	16000	4269
Falcon 10	104	42.90	45.50	15.10	18740	6058
Falcon 20	107	53.50	56.30	17.40	18000	3558
Falcon 20	107	53.50	56.30	17.40	26000	6948
Falcon 200	114	53.50	56.30	17.40	20000	3719
Falcon 200	114	53.50	56.30	17.40	26000	4658
Falcon 50	113	61.90	60.80	22.90	22000	3479
Falcon 50	113	61.90	60.80	22.90	30000	4137
Falcon 50	113	61.90	60.80	22.90	37480	6453
Falcon 900	100	63.40	66.30	24.80	45500	7298
Falcon 900	100	63.40	66.30	24.80	34000	4158
Falcon 900	100	63.40	66.30	24.80	28000	3288
Fairchild 300	116	47.90	42.20	16.80	13230	----
Fairchild SA227-AC	113	57.00	59.40	16.70	14500	----
Fairchild SA227-PC	113	57.00	59.40	16.70	14500	----
GAF Nomad N24A	74	54.20	47.00	18.20	9400	----
Gulfstream AE840	98	52.10	43.00	15.00	10325	----
Gulfstream AE900	100	52.10	42.90	14.90	10700	----
Gulfstream AE1000	103	52.10	43.00	14.90	11200	----
Gulfstream I	113	78.30	75.30	23.00	34000	6785
HS.125-700	108	47.00	50.80	17.60	24800	----
HS.125-800	111	51.37	51.14	17.58	27400	----
Interceptor 400A	78	30.50	27.40	10.10	4030	----
International BN2A	65	53.00	44.80	14.20	10000	----
Lake 200EP	51	38.00	25.00	9.30	2690	----
Lake LA-250	69	38.00	28.10	10.00	3050	----
Learjet 28/29	120	43.75	47.58	12.25	15000	4698
Learjet 28/29	120	43.75	47.58	12.25	13000	3958
Lear Fan 2100	104	39.30	40.60	12.20	7350	----
Merlin IVC	113	57.00	59.33	16.67	12500	4463
Merlin IVC	113	57.00	59.33	16.67	16000	6248
Metro III	112	46.20	59.40	16.70	12500	4469
Metro III	112	46.20	59.40	16.70	16000	6558
Mitsubishi 2B-400	101	39.20	33.30	12.90	10470	----
Mitsubishi 2B-60	105	39.20	39.40	13.70	11575	----
Mitsubishi MU-300	109	43.40	48.30	13.80	14630	----
Mooney 201 M20J	72	36.10	24.70	8.30	2740	----
Mooney T231 M20K	72	36.10	25.40	8.30	2900	----
Partenavia P68C	74	39.40	31.30	11.20	4387	----
Piaggio P.166-DL3	86	48.20	39.30	16.50	9480	----
Piper PA-12	65	35.33	22.75	6.75	1750	----
Piper Tomahawk II	61	34.00	23.10	9.10	1670	----

Model	AppSpeed	WingSpan	AClength	TailHite	TOweight	RWindex
Piper PA-28-161	57	35.00	23.80	7.30	2440	----
Piper PA-28-181	64	35.00	23.80	7.30	2550	----
Piper PA-28-236	73	35.40	24.70	7.20	3000	----
Piper PA-28RT-201T	79	35.40	27.30	8.30	2900	----
Piper PA-31-325	91	40.70	32.60	13.00	6500	----
Piper PA-31-350	96	40.70	34.60	13.00	7000	----
Piper PA-31 T1020	96	40.70	34.60	13.00	7000	----
Piper PA-31 T1040	101	41.10	36.70	12.80	9000	----
Piper PA31T-2XL620	104	42.70	36.70	12.80	9474	----
Piper PA-32-301	81	36.20	27.70	8.20	3600	----
Piper PA-32-301T	75	36.20	28.20	8.20	3600	----
Piper PA-32R-301	74	36.20	27.70	8.50	3600	----
Piper PA-32R-301T	73	36.20	28.50	8.50	3600	----
Piper PA-34-220T Seneca	83	38.90	28.60	9.90	4750	----
Piper PA-42-720	116	47.70	43.40	14.80	11200	----
Piper PA-42-1000	116	47.70	43.40	16.40	11950	----
Piper PA-46 Malibu	75	43.00	28.40	11.30	4100	----
Piper Aerostar 602	100	36.70	34.80	12.10	6000	----
Piper PA60-700P	92	36.80	34.00	12.10	6315	----
Piper PA-31P-350	95	44.50	34.50	13.00	7200	----
Piper PA-23-250 Aztec	77	37.17	31.17	10.25	5200	----
Robin R2160	57	27.30	23.20	7.00	1764	----
Saab 340B	104	70.33	64.67	22.50	30000	7704
Saab 340B	104	70.33	64.67	22.50	25000	4782
Saab-Fairchild SF 340A	104	70.33	64.67	22.50	28000	7135
Saab-Fairchild SF 340A	104	70.33	64.67	22.50	25000	5356
Schweizer 600B	68	42.40	24.50	11.50	7020	----
Short SD3.30	95	74.70	58.00	16.20	22900	----
Short SD3.60	104	74.80	70.80	23.70	26000	----
Taylorcraft F21	48	36.00	22.30	6.50	1500	----
Weatherly 620	74	41.00	27.20	8.10	5600	----
Westwind Astra	110	52.67	55.58	18.17	24650	8927
Westwind Astra	110	52.67	55.58	18.17	23000	6937
Westwind Astra	110	52.67	55.58	18.17	20000	5408
Cirrus VK30	75	39.67	26.00	10.67	3600	----
American AA1 Yankee	74	24.50	19.25	6.83	1500	----
Quickkit Glass Goose	60	27.00	19.50	8.50	1750	----
Beech Starship 2000A	117	54.42	46.08	12.92	14900	----
Metro II SA226-TC	112	46.25	59.42	16.67	12500	4587
Metro II SA226-TC	112	46.25	59.42	16.67	10500	2998
Metro II SA226-TC	112	46.25	59.42	16.67	8500	2294
Bellanca 8KCAB-180	61	32.00	22.93	7.67	1800	----
Bellanca 17-30A Viking	74	34.17	26.33	7.33	3325	----
American Champion 8GCBC	44	36.33	23.00	8.58	2150	----
Embraer EMB-120 Brasilia	108	64.90	65.60	20.80	25353	6946
Embraer EMB-120 Brasilia	108	64.90	65.60	20.80	24000	5948
Cessna 425	103	44.10	35.90	12.60	8600	5221
Cessna 425	103	44.10	35.90	12.60	8200	5073
Cessna 441	99	49.30	34.70	12.80	9850	5038
Cessna 441	99	49.30	34.70	12.80	7800	4408
Cessna 340A	92	38.10	34.30	12.60	5990	4585
Cessna 340A	92	38.10	34.30	12.60	5000	3018
Cessna 402C	95	44.12	36.38	11.45	6850	4989
Cessna 402C	95	44.12	36.38	11.45	5500	3030
Cessna 414A	94	44.10	36.40	11.50	6750	5648
Cessna 414A	94	44.10	36.40	11.50	5700	3826
Cessna 421C	96	41.10	36.40	11.50	7450	4838

Model	AppSpeed	WingSpan	AClength	TailHite	TOweight	RWindex
Cessna 421C	96	41.10	36.40	11.50	6200	3164
Sabreliner NA-265-65	105	50.50	46.10	16.00	19000	6566
Sabreliner NA-265-40	120	44.50	43.80	16.00	18650	7514
Sabreliner NA-265-60	120	44.50	48.30	16.00	20000	8583
Cessna Citation I/SP	107	47.10	43.50	14.33	11850	4344
Cessna Citation I/SP	107	47.10	43.50	14.33	10000	3108

C R I T I C A L P A R A M E T E R S			
Runway Length Index.....	(8927)	Westwind Astra	@ 24650 #
WingSpan.....	(78.30)	Gulfstream I	
Tail Height.....	(24.80)	Falcon 900	
Aircraft Length.....	(75.30)	Gulfstream I	
Takeoff Weight.....	(45500)	Falcon 900	
Approach Speed.....	(120)	Beechcraft 1900	